

## FEATURES

- Input voltage upto 90Vdc
- Efficiency up to 93%
- Pin compatible with LMxx linear regulators (SIP-3)
- Excellent line/load regulation
- Operating temperature range - 40°C to +85°C
- No-load input current as low as 1.5mA
- Continuous short circuit protection
- EN 62368-1

## RS PRO Wide input switching regulator

2369847, 2369848, 2369850, 2369852, 2369853, 2369855



RS Professionally Approved Products bring to you professional quality parts across all product categories. Our product range has been tested by engineers and provides a comparable quality to the leading brands without paying a premium price.

## Product Description

Non-isolated POL converter series with a 10:1 input voltage range provides a high efficiency drop-in replacement for LMxx Linear regulators. With an input range of up to 90V, this regulated, low loss, cost effective range of switching regulators provides a suitable solution for many battery and distributed power applications.

## General Specifications

<b>Model</b>	Non Isolated ultra-wide input 500mA DC-DC converter
<b>Mounting Type</b>	PCB
<b>MTBF</b>	MIL-HDBK-217F@25°C > 2,000,000 hrs
<b>Applications</b>	Battery and distributed power systems

RS Stock#	Input Voltage (Vdc)	Output Voltage	Output Current (mA) Max	Full Load Efficiency % (Typ) Vin Min./Vin Max.	Capacitive Load (µF) Max.
2369847	9...90 Vdc	3.3V	500mA	82/69	100
2369848	9...90 Vdc	5V	500mA	87/75	
2369855	9...90 Vdc	6.5V	500mA	91/78	
2369850	18...90 Vdc	12V	500mA	91/83	
2369852	20...90 Vdc	15V	500mA	93/84	
2369853	36...90 Vdc	24V	300mA	93/85	

Note: \* For input voltage exceeding 80 VDC, an input capacitor of 22µF/100V is required.

## Input Specifications

Input Specification						
Item	Operating Conditions	Min.	Typ.	Max.	Unit	
No-load Input Current	Nominal input voltage	-	-	1.5	mA	
Reverse Polarity at Input		Avoid / Not protected				
Input Filter		Capacitance filter				

## Output Specifications

Output Specification						
Item	Operating Conditions		Min	Typ.	Max	Unit
Voltage Accuracy	10%-100%, input voltage range	3.3V output	-	±3.5	±4.5	%
		Others	-	±2	±3	
Linear Regulation	Full load, input voltage range	3.3, 5 and 6.5V outputs	-	±0.6	±1.5	
		12 and 15V outputs	-	±0.6	±2.0	
		24V output	-	±1.2	±2.5	
Load Regulation	Nominal input voltage, 10% -100% load		-	±1.0	±2.0	
Ripple & Noise*	20MHz bandwidth, nominal input voltage, full load		-	40	80	mVp-p
Temperature Coefficient	Operating temperature -40°C to +85°C		-	-	±0.03	%/°C
Transient Response Deviation	Nominal input voltage, 25% load step change			±0.4	±1.5	%
Transient Recovery Time	Nominal input voltage, 25% load step change			0.2	1	ms
Short-circuit Protection	Nominal input voltage		Continuous, self-recovery			

Note: \* The “parallel cable” method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information;

## General Specifications

Item	Operating Conditions	Min	Typ	Max.	Unit
Operating Temperature	See Fig.1, Fig.2.	-40		+85	°C
Storage Temperature		-55		+125	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds			+300	
Storage Humidity	Non-condensing	5		95	%RH
Switching Frequency*	Full load, nominal input voltage		300		kHz
MTBF	MIL-HDBK-217F@25°C	2000			k hours

Note: \*Different output voltage with different switching frequency.

## EMC Specifications

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 6-② for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig. 6-② for recommended circuit)	
Immunity	ESD	IEC/EN 61000-4-2 Contact $\pm 4\text{kV}$ perf.	Criteria B
	RS	IEC/EN 61000-4-3 10V/m perf.	Criteria B
	EFT	IEC/EN 61000-4-4 100kHz $\pm 1\text{kV}$ (see Fig. 6-① for recommended circuit) perf.	Criteria B
	Surge	IEC/EN 61000-4-5 line to line $\pm 1\text{kV}$ (see Fig. 6-① for recommended circuit) perf.	Criteria B
	CS	IEC/EN 61000-4-6 3Vr.m.s perf.	Criteria B

## Typical Performance Curves

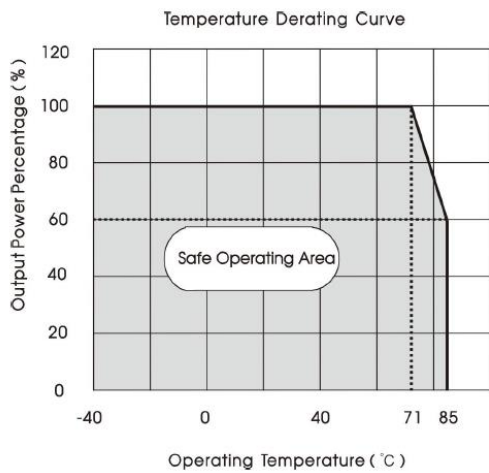


Fig 1. 3.3V, 5V, 6.5V, 12V, 15V  
24V (Vin=36V~60V)

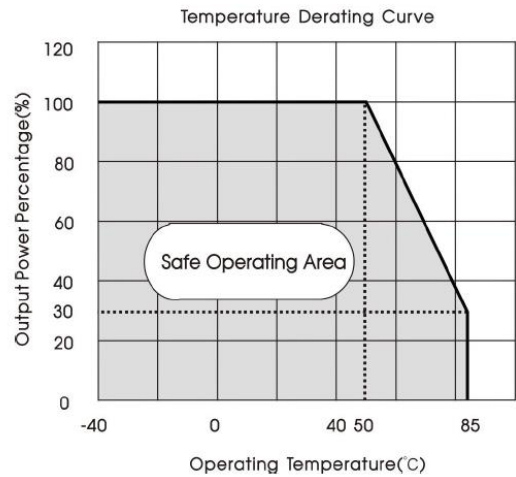


Fig2 24V (Vin ≥ 60V)

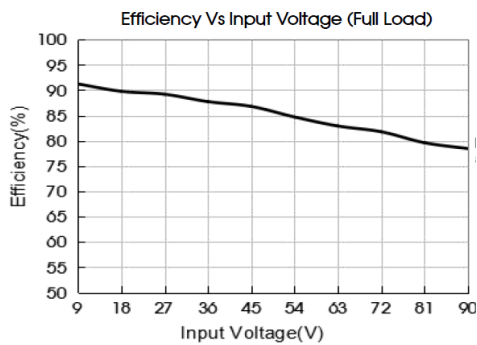


Fig.3

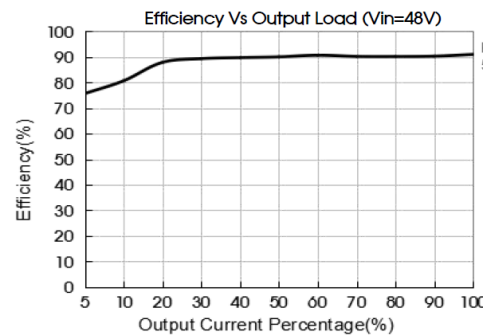


Fig.4

5V output

5V output

**Design Reference**

**Typical application**

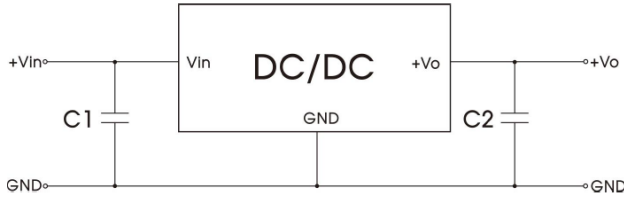


Fig. 5

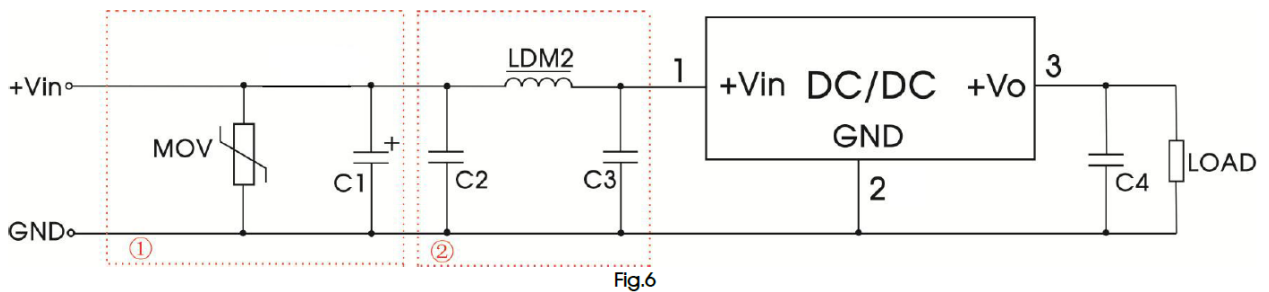
Output	C1 (ceramic capacitor)	C2 (ceramic capacitor)
3.3 VDC	10µF/10V	22µF/10V
5 VDC		22µF/10V
6.5 VDC		22µF/10V
12 VDC		22µF/10V
15 VDC		22µF/10V
24 VDC		10µF/10V

**Table 1**

Notes:

1. The required C1 and C2 capacitors must be connected as close as possible to the terminals of the module.
2. Refer to Table 1 for C1 and C2 capacitor values. For certain applications, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead.
3. Converter cannot be used for hot swap and with output in parallel.

**EMC solution-recommended circuit**

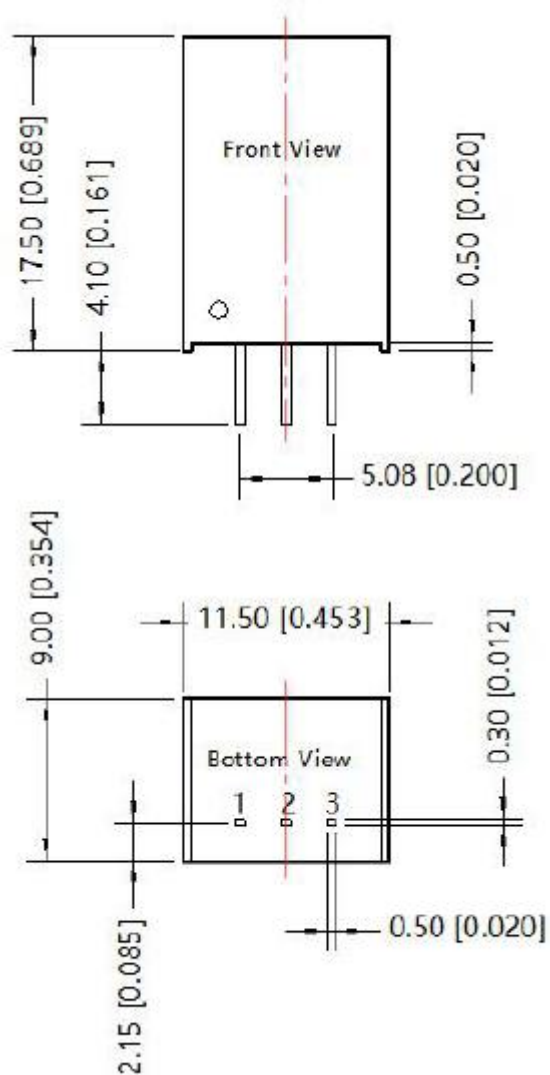


MOV	C1	C2	LDM2	C3	C4
S20K30	680µF /100V	4.7µF/100V	120µH	4.7µF/100V	10µF/50V

### Mechanical Specifications

<b>Case material</b>	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
<b>Dimensions</b>	11.50 x 9.00 x 17.50 mm
<b>Weight</b>	3.8g(typ.)
<b>Cooling Method</b>	Free air convection

### Dimensions and recommended layout



**Additional Information**

<b>Custom Tariff Number</b>	85044090
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1. The maximum capacitive load offered were tested at nominal input voltage and full load
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal
3. All index testing methods in this datasheet are based on our company corporate standards
4. Products are related to laws and regulations: see "Features" and "EMC"
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations.